

2 - Loan Copy Only

THOMPSON RIVER BARK BEETLE CONTROL PROJECT
CABINET NATIONAL FOREST
REGION ONE
MONTANA

1949

Sponsored by

ANACONDA COPPER MINING COMPANY

NORTHERN PACIFIC RAILWAY COMPANY

STATE OF MONTANA

U. S. DEPARTMENT OF AGRICULTURE

Forest Service

Bureau of Entomology and Plant Quarantine

FOREWORD

The mountain pine beetle is an important enemy of western white pine, ponderosa pine, and lodgepole pine throughout the northern Rocky Mountain region. Each year this insect takes an annual toll of many million board feet of white pine. Serious losses of ponderosa pine have occurred in many forests of the region. The destruction of lodgepole pine during the past 30 years is a matter of record. Many ghostlike lodgepole pine forests stand as mute reminders of this destruction. Outbreaks of this insect in lodgepole pine develop rapidly and in a few years green timber stands are turned to mountainsides of dead trees.

The Thompson River control project on the Cabinet National Forest was directed against an outbreak of the mountain pine beetle in lodgepole pine. Not only were valuable stands of lodgepole pine in jeopardy, but the danger of this infestation spreading from lodgepole to the intermingled and adjacent ponderosa pine stands increased its economic importance.

This infestation was first reported in the fall of 1947. Ranger Raymond West in his Annual Ranger's Report listed a small group of infested lodgepole pine trees at the head of Cedar and Corona Creeks. His description of this situation indicated that the trees had been attacked during the 1947 season, and that the situation was of sufficient importance to warrant further examination. In September 1948, Mr. Gibson of the Forest Insect Laboratory at Coeur d'Alene, Idaho, examined the area mentioned by Ranger West. Although he was unable to relocate the infested trees recorded, he did find evidence of a rather general infestation throughout the lodgepole pine stands of the Thompson River drainage. It is difficult to state just when this infestation started to build to its present severity but existing data indicate that within the Meadow Creek drainage there was some loss as early as 1946.

Justification for control within this area is quite evident. Past records show that serious epidemics of this beetle in lodgepole pine do spread into valuable ponderosa pine stands adjacent. This is bound to occur if a shortage of lodgepole host material exists while the beetle population is still at an epidemic level. The finding of some infested ponderosa pine trees and wind-falls in the Thompson in 1949 emphasizes that this threat was already present and it would increase rapidly as the infestation grew.

The area threatened is quite extensive. The upper three-fourths of the Thompson River drainage, the McGregor Lake and Thompson Lakes areas are all definitely endangered by this infestation. The timber stands within the Pleasant Valley Creek drainage, Dahl Lake and Little Bitterroot Lake areas are also endangered. Although these timbered areas are somewhat removed from the heavy infestation of the Meadow Creek area, they are not immune from the potential spread of such outbreaks. The land ownership within the immediate areas threatened by this infestation is as follows: Federal Government, national forest and public domain 54.5 percent; Anaconda Copper Mining Company 23.4 percent; Northern Pacific Railway Company 15.8 percent; State of Montana 6.3 percent.

SUMMARY

THOMPSON RIVER BARK BEETLE CONTROL PROJECT MAY 18 TO JULY 9, 1949

Area Threatened

Thompson River drainage - 355,940 acres.

Ownership

Federal Government 54.5 percent; Anaconda Copper Mining Company 23.4 percent; Northern Pacific Railway Company 15.8 percent; State of Montana 6.3 percent.

Dates

Infestation began 1945-46. First reported November 1947. Initial examination 1948. Intensive precontrol surveys April and May 1949. Control work authorized May 18, 1949. Concluded July 9, 1949 (except for accounts, camp area and equipment clean-up).

Precontrol Surveys

First extensive examination made late in 1948. First intensive survey made in April 1949 and real seriousness of situation fully recognized. Additional precontrol surveys completed in May 1949.

Control Project

Organized and supervised by Forest Service, U. S. Department of Agriculture. Financed by Anaconda Copper Mining Company, Northern Pacific Railway Company and Federal Government on proportionate land ownership basis. Technical assistance furnished by Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. Infested trees found, designated, treated with spray mixture of 1 part orthodichlorobenzene to 5 parts Diesel fuel oil. Infestation confined 99 percent to lodgepole pine. Trees treated to a height of 35 feet with stirrup type, hand-operated pumps.

Organization

Three work camps and one central overhead and service of supply camp used. Maximum number of men employed - 140. Project handled on an emergency basis; drafting overhead, manpower and equipment needs from the regional office and 12 forests of Region One, Forest Service.

Statistics and Costs

Number of acres covered - 22,525.

Number of trees treated - 19,420.

90 percent of area string laid and tree spotted for 35 percent of trees in advance of treating.

10 percent of area tree spotted and treated as one operation for 65 percent of total trees treated.

7,000 gallons orthodichlorobenzene and 35,000 gallons Diesel fuel oil used, or 2.17 gallons of the mixture per tree treated.

45 mules and 15 saddle horses used to distribute spray to treating crews off roads.

10 1½-ton stake trucks, 9 pick-ups, 2 sedans, 1 2-ton stock truck, 1 shop truck, 1 convoy lubricator, 1 D-6 dozer, 1 D-4 dozer, 1 dragsaw outfit comprised automotive equipment:

6 miles of Forest Service class 1 access road built to heaviest infestation area in Meadow Creek.

\$107,448 - total cost of project, including surveys and overhead.

Cost Break-Down

*1. Wages - including leave and travel time	\$ 55,274
2. Equipment and materials - including rentals	13,179
3. Subsistence - including transportation and per diem	14,673
4. Orthodichlorobenzene and Diesel fuel oil.	12,957
5. Automotive equipment rentals and operation.	5,505
6. Overhead and miscellaneous expense.	<u>5,860</u>
Total	\$107,448

Man-Day Break-Down

1. Man-days of field control time	3,196	60.5%
2. Man-days camp construction and dismantling	619	11.7%
3. Man-days camp operation.	923	17.6%
4. Man-days travel to and from project.	132	2.5%
5. Man-days leave earned on project	<u>405</u>	<u>7.7%</u>
*Total man-days	5,275	100.0%

*Total cost man-days was 51.44 percent of the project cost.

Cooperation

Entire project, including precontrol surveys, jointly sponsored by the Anaconda Copper Mining Company, Northern Pacific Railway Company, State of Montana, U. S. Forest Service and Bureau of Entomology and Plant Quarantine.

Precontrol Survey and Organization Meetings

Following the discovery of the Thompson River infestation in 1947, Mr. Gibson with two strip runners was able to obtain a relatively few acres of sample strip. Unfortunately as this project had not been included in the season's program, time and personnel were not then available for a proper coverage. Although this small amount of data could not be used as a basis for control, it did indicate the seriousness of the situation and the need for a more thorough survey. Following the submission of Mr. Gibson's report of this situation, a meeting of interested private owners and Federal and State officers was held in Missoula on March 1, 1949. Representatives from the Lumber Department of the Anaconda Copper Mining Company, the Northern Pacific Railway Company, State of Montana, Western Pine Association, U. S. Forest Service, and Bureau of Entomology and Plant Quarantine, were in attendance. Mr. Gibson's report of the extensive examination made in September 1948 was presented and all phases of the situation thoroughly discussed. Mr. Evenden, Bureau of Entomology and Plant Quarantine, stated that although the available data indicated a serious situation, they were not of sufficient intensity to permit plans for control to be based upon them. The potential seriousness of the situation was recognized by those in attendance. More survey information was recognized as needed. Until more information could be obtained only a tentative decision regarding the possibility of a cooperative control project.

could be reached. Representatives of the private agencies agreed to give the matter further consideration and to determine the extent to which their companies would participate if a control program was subsequently recommended. As a step in arriving at a basis for a division of project cost between the different agencies involved, the land ownerships within the infestation unit were indicated on a map of the Cabinet National Forest. It was tentatively agreed that payments should be made on the basis of timber lands protected, regardless of the location of the infestation. At the March 1 meeting it was fully appreciated that the possibility of instituting control depended entirely upon more intensive and significant information concerning the existing status of the infestation. As no Federal funds were available for such an additional survey, the Anaconda Copper Mining Company agreed to finance or underwrite the cost of obtaining data necessary for the planning of control. On April 12, a cooperative agreement covering the cost and administration of this survey was drawn by the Anaconda Copper Mining Company and the Forest Service. This project, under the direction of Mr. A. L. Gibson from the Bureau of Entomology and Plant Quarantine, was started on April 13 and completed on April 24. Forest officers were detailed from different forests within the region to serve as crew members. Unfortunately, this project was handicapped by unfavorable working conditions. Deep snow prevented the extension of the work into many areas about which information was desired.

Following the conclusion of this survey a second meeting of representatives of the above public and private agencies was held at Missoula on April 27. At that time the results of the recent survey were presented. These data showed the infested area to be much larger than had been previously assumed and that the infestation extended to the north of McGregor Lake. Once again the officers responsible for obtaining these data were obliged to present a serious situation, without sufficient data to tell the complete story. As the destructive potentials of this infestation were now fully apparent to all agencies concerned, an immediate aerial survey was planned to obtain data that would indicate the northern extent of this infestation. This survey was completed on the 29th of April and a third meeting of interested officers and representatives was held at the office of the Anaconda Copper Mining Company at Bonner on April 30.

At this meeting the results of the aerial and ground surveys were presented by Messrs. Evenden and Gibson of the Bureau of Entomology and Plant Quarantine. Mr. Evenden stated that the situation warranted control and that sufficient data were available to permit plans to be drawn. Although the size and cost of the project could be fairly well estimated, the need for some more intensive ground survey work north of U. S. Highway 2 was indicated. The need for this additional survey was agreed upon with the cost to be again underwritten by the Anaconda Copper Mining Company and on this survey the Northern Pacific was to furnish and pay part of the survey crew. The magnitude of the entire project was estimated as involving some 15,000 to 20,000 infested lodgepole pine trees, with the cost being placed at approximately \$100,000. The Anaconda Copper Mining Company and Northern Pacific Railway Company representatives stated that their companies were ready to stand their proportionate share of the cost of such a control program. The State of Montana was without finances with which to participate unless and until the state legislature could appropriate its needed share of the funds. It was agreed by all parties concerned that if a control program were undertaken its administration would be handled by the Forest Service, with the technical direction of the work being the responsibility of the Bureau of Entomology and Plant Quarantine. Although no Federal funds were available, unofficial information indicated that a Federal

appropriation would probably be forthcoming. Following this action Forest Supervisor Sutliff on the Cabinet National Forest was authorized to take preliminary steps in organizing a 100-man control program. A final survey was begun on April 28. In addition to the financing of this survey by the Anaconda Copper Mining Company, the Northern Pacific Railway Company furnished two men and the J. Neils Lumber Company of Libby, Montana, furnished one man. The Neils Lumber Company, although not owners of land within the infested area, were interested to the extent that they have large holdings to the north of this area. The survey and preliminary preparation were completed May 13. The preliminary steps included the solicitation of bids for chemicals, hand sprayers, and other special materials and equipment. Also, a tentative roster of overhead, manpower, transportation and equipment was prepared. No further action could then be taken as no expenditure of Federal funds was authorized.

On May 18, representatives of the Forest Service met with Mr. George Neff of the Anaconda Copper Mining Company, at which time it was pointed out that if control were to be undertaken this year it would be necessary to get the project started at once. Mr. Neff agreed in behalf of the Anaconda Copper Mining Company and the Northern Pacific Railway Company, after discussing the situation with them by telephone, to undertake the project on the basis the Forest Service would subsequently put up its share if Federal funds for the purpose were made available by Congressional action. As a result, the Anaconda Copper Mining Company and the Northern Pacific Railway Company made their shares of the estimated cost of the project available in order that the control program could be initiated. Action was started on May 18 to get the full program under way in the shortest period of time.

As previously stated the main owners of timber lands within the area boundary are as follows:

	<u>Acres</u>	<u>Percent</u>
Forest Service	189,880)	
Public Domain	4,080)	54.5
Anaconda Company	83,320	23.4
Northern Pacific	56,260	15.8
State of Montana	<u>22,400</u>	<u>6.3</u>
Total	355,940	100.0

The state legislature not being in session, the state government could not contribute its share, at least until the legislature meets in 1951. State Forester Parker assured the other landowners that the request to pay the state's share retroactively would be presented to the legislature at the next session. Since immediate action was vital, the participating owners agreed to advance the state's share by increasing their contribution toward the cost on a pro rata basis. The following formula was used to determine the part to be paid by each cooperator:

	<u>Acres</u>	<u>Percent</u>
Forest Service	189,880)	
Public Domain	4,080)	58.2
Anaconda Company	83,320	24.9
Northern Pacific	<u>56,260</u>	<u>16.9</u>
Total	333,540	100.0

The total cost of the project was estimated at \$100,000. A cooperative agreement was drawn and signed by each landowner. See copy in the appendix of this report. Although the state forester signed as a cooperator, the agreement clearly sets forth that the state forester is not obligated to any expenditure except upon passage of appropriation by the Legislature of the State of Montana from which expenditures thereunder may be made retroactively to reimburse the other parties of the agreement to the extent that their share was increased because the State of Montana was not in a position to finance its share at the present time.

When the project was started on May 18 it was thought that Federal money would be available by June 1 through the second deficiency pest control act of 1949. This money however did not become available for obligation until June 17. The Anaconda Copper Mining Company and the Northern Pacific Railway Company made their share of money available as used. This money was all obligated by June 10 and on that date the question of discontinuing the project was happily solved by the Anaconda Copper Mining Company underwriting further expenditures to the amount of \$16,000 in special deposit until Government funds became available. Fortunately, the second deficiency act provided a retroactive clause which permitted payment of unpaid obligated expenditures, so that it was possible to refund to the Anaconda Copper Mining Company the \$16,000 when second deficiency funds became available.

Institution of Project

As a result of the preliminary steps previously taken, men and equipment from Missoula, Spokane and various forests of Region One began arriving at the project headquarters (Bend Ranger Station) on May 20. Three project work camps in addition to the headquarters camp were then established. Camp 1 was located on Indian Creek and was in operation by May 23. Camp 3 was placed at the Little Thompson River Junction and was in operation by May 25. Camp 2 was established at the McGregor Guard Station and was operating on May 30. Camp 2 and 3 were disbanded on June 25 and a general reduction in forces started. Camp 1 was disbanded on July 9 and all manpower released except for a 10-man crew assigned to camp dismantling and storage of equipment.

Approximately 80 forest officers and laborers were detailed to the project from 12 different national forests of the region. In addition to these men, 60 laborers were recruited from various communities adjacent. The maximum number employed on the project was 140. The heaviest load of employment occurred during the period from June 6 to June 25. A safety program was prepared at the start of the project, with the project superintendent being given regional office assistance. All project and safety training was completed by the 5th of June. It is gratifying to report that the entire program was completed without serious accident to man, pack stock or equipment. Forest officers detailed to the project as overhead were most helpful in making the operation a success. In using such men, training requirements were materially reduced and the speed and thoroughness of the work greatly increased.

Equipment used on the project included 1 D-6 and 1 D-4 bulldozer, 10 1½-ton stake body trucks, 9 pick-up trucks, 2 sedans, 1 2-ton stock truck, 1 shop truck, 1 convoy lubricator and 1 dragsaw outfit. Bulldozers were used to construct approximately 6 miles of low-class road at a cost of approximately \$450. This road extended up Meadow Creek and permitted easy access to the heaviest infestation within the project. Countless hours of foot travel and miles of oil transport by pack stock were saved. Forty-five pack mules and 15 additional horses were used to distribute spray to the treating crews.

The organization of this project has been stated. The forest supervisor of the Cabinet National Forest was assigned responsibility for all administrative phases and financial accounting. The Bureau of Entomology and Plant Quarantine had responsibility for the technical phases of the program. There is a project organization chart in the appendix of this report.

Technical Phases of the Project

The method of control used was to spray the bole of standing infested trees. The spray, consisting of 1 part of orthodichlorobenzene to 5 parts of no. 2 Diesel oil, penetrates the bark and kills the insect broods that lie between the bark and the wood. In using this method it is essential that a thorough coverage of the infested portion of the bole be obtained.

The spray equipment was a small stirrup pump purchased under bid from the D. B. Smith Company. This pump, which is manually operated, pumps directly from a jeep can. Telescopic spray extension rods were used at the end of the hose to obtain greater height of treatment. These 6-foot rods could be extended to a total length of 11 feet. A nozzle especially designed for this equipment and method of treatment was used.

All of the infested trees were located for treatment and spotted on a map in the areas of light infestation. The treating crews were guided by the map location. In blocks of heavy infestation the area was laid off in small units or strips with string lines and covered by a combination crew which both located and treated the infested trees.

Although actual control techniques are relatively simple and are not difficult to perform, they require adequate training. There are certain skills to be developed in determining the trees to be treated as well as the actual treating of trees that must not be minimized. Time spent on training is returned many times by increased efficiency throughout the operation. Furthermore, training must be continuous, for although men may be properly trained, they easily slip back into careless habits if not checked. To provide for such continuous training, three well-qualified forest officers were assigned as checkers. These men spent their entire time in visiting spotting and treating crews throughout the area, and in training new men in their assigned duties.

Crewmen were trained through the camp and crew leaders. As these keymen arrived at the headquarters camp they were immediately given intensive training and instructions in the techniques of string laying, recognition of infested trees, crew leadership, and the necessary skill in applying penetrating spray to standing trees. They were then assigned to specific duties and in turn assumed responsibility for the training of the crews assigned to them.

Control Work

Spotting started on May 27. To have sufficient trees marked ahead of the treating crews the actual treatment of trees was delayed until June 7. All scattered areas of infestation, which amounted to approximately 85 percent of the total, were completed by June 25. For the remainder of the project period, control efforts were concentrated in the heavily infested areas found within the Meadow Creek drainage.

The original infestation unit was estimated to be some 35,000 acres, with from 15,000 to 20,000 infested trees. As in some areas the infestation was

subsequently found to be too light to warrant treatment, the total acreage covered by control was reduced to 22,525. The actual number of trees treated was 19,420. More than 95 percent of the infested trees were mature lodgepole pine. Only an occasional standing ponderosa pine tree was found to be infested. However, all windthrown ponderosa pine trees required treatment.

Of the total acreage treated, 90 percent was covered by a 100 percent spotting, on which only 35 percent of the total number of trees were found. The remainder of the area was covered by combined spotting and treating crews and accounted for 65 percent of the trees treated. Instructions called for the treatment of all trees to a top diameter limit of 4 inches or to the maximum height possible with the equipment being used, which is approximately 35 feet. In some instances these instructions resulted in an unnecessarily high treatment. However, this rule takes away from the crew leaders the time-consuming responsibility of determining the height of infestation and assures a thorough treatment of practically all trees. On properly treated trees this method of treatment again proved to be 100 percent effective. In the treatment of the infested trees 7,000 gallons of orthodichlorobenzene and 35,000 gallons of Diesel oil were used. Treatment averaged 2.17 gallons of spray per tree.

Results of Control

The 1949 control project can be considered as being as nearly successful as possible under existing circumstances of delayed appropriations, short working season, etc. The insects have not, however, been eliminated from the area. Further work will be required in 1950 to bring about a clean-up of this infestation. Although the goal is always set at a 100 percent treatment of all infested trees within the area treated, it is realized that this ideal may not be obtained. Even with the best spotting crews, infested trees are missed. These provide a nucleus for subsequent infestations as long as biological factors remain favorable for build-up of broods. Although a real effort was made to obtain thorough treatment of all trees, a few trees were missed. Furthermore, and of more consequence, is the fact that there was partial emergence of some of the broods before the project was completed, due in part to the lateness of Federal money, but largely to an unseasonably early, hot spring.

The actual results obtained from control will not be known until after the post-control survey has been completed. Even at that time it will be difficult to measure actual results as it is impossible to tell what conditions would have prevailed had no control been instituted. Past experience shows that if 80 percent of the beetles within the Thompson River drainage were destroyed, the potential for the 1949 infestation has been reduced by 80 percent of what it would have been without the control measures. The success of the control project, while not complete, evidently has prevented the three or fourfold multiplication of infested trees that would have occurred without treatment.

The timber stands of the Thompson and adjacent Pleasant Valley are the most valuable in the state. As time has passed, crowding of the trees and the ripening of many of the trees in the stand have created conditions favoring attack by beetles. Until the ripest trees are harvested and the crowded condition is corrected, there will continue to be danger of disastrous beetle epidemics. If the road system required for future timber harvest were now in place, it would be practical to salvage the merchantable material from groups of trees as attacked. If adjacent high-risk, ripe trees could be removed at the same time, the stand could gradually be made safer against attack without materially reducing the timber available for future harvest. Such a road system would at the same time greatly simplify annual observation to detect

new attacks and reduce the cost of any required beetle spraying operations. The economic feasibility of building all or parts of the road system at an early date should be further explored.

Weather conditions that prevailed throughout the control period were ideal for effective work. Only one day was lost as a result of rain, which was subsequently made up by substituting work on another non-workday. Unusually early warm weather was also a handicap to the success of the project. This condition hastened brood development, and as stated, there was considerable emergence of beetles and new attacks occurring prior to the completion of the operation. New attacks were treated as found until the end of the job, but obviously it was impossible to go over the entire project a second time to get them all. The completion date for all similar control projects should be planned for July 1.

Post-Control Survey

A post-control survey of the Thompson River infestation unit under the direction of the Forest Insect Laboratory started on August 1, and is to be completed by September 30, 1949. This survey will check all areas covered by control, and extend into all other areas of lodgepole pine throughout the general areas. A report of this survey will be submitted immediately following its completion.

Finance and Accounts

As previously stated, the control program was initially financed by the Anaconda Copper Mining Company and the Northern Pacific Railway Company until Federal appropriations became available on June 20. The total cost of the project was \$107,448, including the cost of precontrol surveys and indirect overhead (clerical services and other indirect costs for which all projects are assessed a proportionate amount). They do not include post-control survey costs, which are now being incurred.

The average cost per individual tree treated is \$5.53. Average cost per individual tree-acre is \$0.000246. The tree-acre cost is believed to be more indicative of the true cost of the project since it brings area covered as well as trees treated into the cost picture. Tree-acre costs are arrived at by multiplying total number of trees by the total number of acres covered and dividing the result into the total cost of the project. This figure is of value for comparison with other projects.

A 48-hour workweek was established at the outset of the project. In addition work was performed on one holiday, the Fourth of July. No work was performed on Memorial Day.

Following is a break-down of the total number of man-days spent on the project:

1. Man-days of field control time	3,196	60.5%
2. Man-days camp construction and dismantling	619	11.7%
3. Man-days camp operation	923	17.6%
4. Man-days travel to and from project	132	2.5%
5. Man-days leave earned on project	405	7.7%
*Total man-days	5,275	100.0%

*Total cost man-days was 51.44 percent of the cost of the project.

Item 1: Includes all man-days used on actual control work such as precontrol surveys; training, control surveys, string laying, mapping; tree spotting, the mixing of oil and ortho, transportation of mix by truck and pack mule to the job, actual control treating and the construction of such roads and trails as were needed. One hundred ninety man-days were used in project work and safety training and 151 man-days on precontrol surveys.

Item 2: Includes man-days to transport materials and to construct the three camps; also to dismantle, check, transport and return all equipment to places of procurement. Also clean-up reports, accounts and final office work.

Item 3: Includes man-days of actual camp operation such as cooks, flunkies, bull cooks, clerks, camp truck drivers and wood procurement.

Item 4: Includes the man-days of actual travel time required by personnel detailed from other forests to the project and return to their headquarters at close of the project.

Item 5: Includes man-days of leave earned by all employees while on project pay rolls. Twenty-one man-days of this leave earned by regular ranger and staff personnel was absorbed by home units and not charged against project.

Following is a cost break-down for the project:

1. Wages	\$ 55,274
2. Equipment and materials	13,179
3. Subsistence	14,673
4. Oil and ortho	12,957
5. Equipment rentals	<u>5,505</u>
Total project field cost.	\$101,588
Indirect overhead, vouchering and miscellaneous	<u>5,860</u>
Grand total	\$107,448

The following equipment and left-over subsistence supplies for general forest use and the value thereof have been deducted from the above grand total:

Equipment and materials	\$900.68
Subsistence	\$712.52

Item 1: Includes all wages on job, while in travel status, and leave earned on job, not contributed.

Item 2: Includes camp rentals, lumber, stoves, pipe fittings, spray pumps and fittings, mixing tank, jeep cans, string, tags, nails and all miscellaneous hardware, freight costs and other items necessary to construct, equip and maintain the camps and supply the jobs. All water system pipe was loaned to the project without charge; likewise, mapping and survey equipment.

Item 3: Includes all food supplies, freight costs thereon, and per diem.

Item 4: Includes all Diesel oil, chemical and freight costs.

Item 5: Includes all automotive equipment operating and rental costs, including bulldozer and airplane hire.

Wage Scale

Men detailed from forests who held civil service appointment were paid at regular rate and assigned to duties as near their wage scale as possible.

Following is the general wage scale paid on the project. Payment was made at overtime rates for hours worked in excess of 40 hours per week.

	<u>Per annum rate</u>	<u>Rate per hour</u>
Special laborers (This class includes string layers, oil mixers and miscellaneous.)	\$2,600	\$1.25
Semiskilled labor (Includes spotters, assistant spray nozzlemen, etc.)	\$2,808	\$1.35
Strawboss (This class includes chief spotters, spray nozzlemen and small crew leaders.)	\$2,912	\$1.40

In the appendix following this narrative section are overhead assignments, sample forms used, instructions for the several phases of the job, a map of the area, a description of the mountain pine beetle, its life cycle and other pertinent data of interest to those who are interested in more detail than is contained in the foregoing section.

APPENDIX

OVERHEAD DETAILED TO PROJECT
AND PROJECT ASSIGNMENTS

Name	Title	Forest	Project assignment
C. B. Sutliff	Forest supervisor	Cabinet	General administration
Earl Tennant	Adm. assistant	"	Equipment and supply and pay rolls and vouchers
H. F. Johnson	Foreman	"	Project superintendent
F. L. McClure	Clerk	"	Audit and fiscal control
Merrill Tester	Ranger	"	Camp boss, camp 1
C. W. Gustafson	Assistant ranger	"	Woods boss
J. W. Fields	Forestry aid	"	Assistant camp boss, camp operation and maintenance, control reports, map making, timekeeping, equipment and supply
C. W. West	Logging engineer	Regional Office	Equipment and supply
G. M. Daugharty	Forester	Flathead	Camp boss, camp 2
A. D. Schaffer	Forestry aid	"	Woods boss
C. F. Spindler	Forestry aid	"	Chief spotter
A. C. Arvidson	Forestry aid	"	Spotter-control foreman
R. J. Adams	Forestry aid	Clearwater	Assistant camp boss, camp operation and maintenance, control reports, map making, timekeeping, equipment and supply
C. E. Gilbertson	Forestry aid	Kootenai	Woods boss, control crew foreman
J. D. Garrigues	Fire prevention aid	"	String layer
C. W. Wetterstrom	Ranger	Kaniksu	Camp boss, camp 3
V. D. Schurr	Forester	"	Chief spotter
S. S. Evans	Forester	"	Checker
W. H. MacKenzie	Assistant ranger	"	Woods boss, camp 3
L. B. Wagner	Forestry aid	"	String layer

Name	Title	Forest	Project assignment
T. W. Seiger	Forester	St. Joe	Spotter, control crew foreman
H. R. Larson	Dispatcher	" "	Assistant camp boss, camp operation and maintenance, control reports, map making, timekeeping, equipment and supply
H. Wilkerson	Forestry aid	Bitterroot	Chief spotter
E. L. Young	Dispatcher	Colville	Checker
A. H. Dillard	Assistant ranger	Lolo	Woods boss
B. O. Runyon	Foreman	"	String layer
H. Hansen	Foreman	"	Chief spotter
M. B. Roark	Coop. agent	Clearwater	Spotter, control crew foreman
C. E. Erickson	Foreman	"	Spotter
Elden McKee	Leatherworker	R&S	Head packer

M-1012-R1

SPOTTER'S DAILY RECORD

Project area _____ Unit _____ Camp no. _____

Date _____ T. _____ R. _____ Sec. _____

Man-days _____ Acres _____

Number trees _____

(Chief spotter) _____

S	Tree number	T	S	Tree number	T	S	Tree number	T	S	Tree number	T
	1			26			51			76	
	2			27			52			77	
	3			28			53			78	
	4			29			54			79	
	5			30			55			80	
	6			31			56			81	
	7			32			57			82	
	8			33			58			83	
	9			34			59			84	
	10			35			60			85	
	11			36			61			86	
	12			37			62			87	
	13			38			63			88	
	14			39			64			89	
	15			40			65			90	
	16			41			66			91	
	17			42			67			92	
	18			43			68			93	
	19			44			69			94	
	20			45			70			95	
	21			46			71			96	
	22			47			72			97	
	23			48			73			98	
	24			49			74			99	
	25			50			75			100	

S
CONTROL
Insect

M-1099.009-R1

CHECKER'S REPORT
Insect Control

Forest _____ Camp _____ Chief spotter or foreman _____
Date _____ Time _____ Area or drainage _____
String line numbers _____

Spotting

Approximate acres checked _____ Marked trees _____% Missed trees _____%

Treating

	<u>List tree numbers checked</u>	
<u>Proper treatment</u>	<u>Too low</u>	<u>Poor coverage</u>

Total _____

Remarks:

Checker

Action recommended:

S
CONTROL
Insect

M-1099.010-R1

CHECKER'S SUMMARY
Insect Control

Forest _____ Date _____ Checker _____

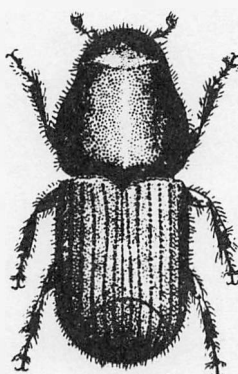
	Camp	Crew	Spotting or treating
1			
2			
3			
4			
5			
6			
7			
8			

Comments relative to the above

1			
2			
3			
4			
5			
6			
7			
8			

Copies: Camp, project supervisor, regional office representative, Bureau of
Entomology representative.

MOUNTAIN PINE BEETLE



ACTUAL
SIZE

ADULT



ENLARGED



EGG



ACTUAL
SIZE

LARVA



ACTUAL
SIZE

PUPA

Drawings on this page and descriptive text following are reproduced from notebook folder entitled "Targhee-Teton Bark Beetle Control Project," prepared by USDA, Forest Service, Intermountain Region, Bureau of Entomology and Plant Quarantine, 1949.

ABOUT THE MOUNTAIN PINE BEETLE

The adult mountain pine beetle is black, cylindrical in shape, slightly less than one-fourth of an inch long, and not quite as big around as a match. Trees are attacked by female beetles which tunnel into the inner bark and work along the surfaces of the wood. Galleries are always constructed upward. They vary from less than a foot to several feet in length. There may be a half dozen or more galleries in each square foot of bark surface. Soon after the attacks are started, male beetles enter the tunnels to mate with the females.

Eggs are laid along the sides of this tunnel and packed in with boring dust or frass. During late summer the eggs hatch into small white grubs (larvae), which feed out laterally into the soft inner bark. They are inactive during the winter, but resume feeding in the spring and become full grown in late July when they transform to adult beetles. The stage of transformation which occurs at the end of their feeding tunnel is known as the pupa. The newly formed adult beetles emerge and immediately attack other green trees.

Although there is but one generation of this insect each year, the females, after completing one egg gallery and laying eggs, sometimes emerge and make a second attack in another tree. This usually occurs in early fall. However, some of the females remain all winter in the trees which they first attacked and emerge and make their second attack the following June. These June attacks are of no great importance as they are few in number.

There is usually a flow of pitch from the injured living bark which occasionally is so heavy that the beetles are washed from the entrance hole. These are called "pitched out attacks." However, on most attacked trees this flow of pitch mixed with boring dust flows from the injured living bark and is pushed from the entrance hole by the male beetle, forming a "pitch tube" on the bark surface. On some trees these tubes are quite small, and difficult to see. Pitch flow usually stops after 1 or 2 inches of the tunnel has been constructed.

GENERAL INSTRUCTIONS

Spotting Crew, Organization and Duties

Spotting is the job of finding and marking infested trees for follow-up "treaters." It is the first step in the actual field work of bark beetle control. The success of the entire project rests on an A-1 spotting job.

When working between previously laid string lines a spotting crew consists of five men - a chief and four spotters. It is their job to find, mark, and map every infested tree within their assigned area.

Detailed Duties of Spotting Crew Personnel

Chief Spotter

The chief spotter is in charge of a single spotting crew and is responsible for their work. He must (1) see that all infested trees are found and marked, (2) make sure that the location of the marked trees is properly shown on a strip location map previously prepared by a compass man, (3) provide the treating crews with copies of his maps, and (4) provide the camp manager with proper records of crew's work.

These maps are an essential requirement of the treating crews to provide for an easy and quick relocation of trees to be treated. The actual field location of

marked trees is shown on a tag which is hung on the string line opposite the trees. The tags will be placed on alternate lines.

In the operation of a spotting crew, the chief spotter follows at a distance which will permit him to keep all members of his crew in proper formation. He must be in a position to assist each crew member as the need occurs. He must travel back and forth across the four-chain strip of the crew to check for missed trees and to see that infested trees are properly marked. When trees are located for marking, he calls the tree numbers to the spotters, and records their position on a map made by the compass man. It then becomes known as the spotter's map.

Compass Man

The compass man is under the direction of the woods boss or camp boss and will work ahead of the spotters and lay string lines to mark off spotting strips in the area assigned to the spotting crew. He starts from a point selected by the woods or camp boss and paces the distance across the area on a predetermined compass bearing. The string line is laid as he travels this course. This is done by tying the end of the string to a branch or tree and then carrying the conical ball of string on the end of a stick or on a frame attached to his back. The string unwinds as the compass man moves forward. As these lines are laid the compass man will make a simple map showing, in addition to the location of string lines, such important physical features as the main streams, prominent ridges, fence lines, roads, trails, etc. He must leave room on the map to plot the location of infested trees.

The starting point of each string line is marked with the number of the line on a tree blaze or stake. Tags may be used for this purpose. This point and string line stations at ten-chain intervals are marked on the map. For example, the start of a string line will be marked "Line #1," or whatever number it may be; the first ten-chain station "Sta. 1-A," the second station "Sta. 1-B," and so on to the end of the line. All stations or marks established in the field must be shown on the map.

Points for Compass Man to Remember

Make all map recordings as small and neat as possible. Always use a sharp pencil. Make tree blazes carefully. Poor or dead trees should be selected for station marks - never healthy vigorous trees. If none but healthy trees are present, use stakes at least 4 feet high.

When the end of the strip line is reached, the compass man will offset the required number of chains in the direction determined by his supervisor chief spotter, and return on a compass line parallel to the first line. This will be string Line #2 and so marked on the map. Stations will be established at ten-chain intervals the same as on Line #1. There is no need to keep the stations on different string lines opposite each other.

String lines will be laid four chains apart. The width of strips will be set by project officers prior to starting the work, and will not be changed unless by one authorized to do so.

Spotting Crew Instructions

Spotters find and mark the infested trees. It is their job to look at all lodgepole pine trees on their assigned strip and to mark those containing active broods of the mountain pine beetle. The four spotters work abreast of

each other, and each spotter examines all lodgepole pine trees on a strip one chain (66 feet) wide. To examine all trees it is necessary for each spotter to follow a weaving course as he moves forward on his strip. By looking ahead he can plan his course to pass near all the trees to be examined with the least amount of travel. It is necessary to pass close to, and to look carefully at, every lodgepole pine above 4 inches in diameter. Some infested trees show pitch tubes which are a visual external evidence of attack, easy to see. Others are difficult to see. There is always some external evidence of attack but it may be only a bit of reddish dust in the cracks of the bark, a few small holes the size of BB shot, or a few small pitch tubes. It is because of these "blind attacks" that every tree must be examined closely.

As the spotters advance, moving back and forth across their strips, the chief spotter follows to check the formation and work of his crew. When a spotter finds a tree which he may think is infested he quickly examines it for the presence of mountain pine beetle brood (eggs, larvae, pupae, living adult beetles). The presence of live brood is all the evidence needed to mark the tree for treating. Old trees, which have been killed for a year or two, will sometimes have only dead adult beetles in the tops of egg galleries. Such trees must not be marked.

When trees are to be marked, the spotter calls "number." The chief spotter will call back the serial number to be used, which the spotter writes on the blazed surface of the tree. Each individual tree, or the outside trees of a group, are blazed on two or three sides so that they can be seen from several directions.

Spotters must keep a good formation. Calling back and forth between adjacent workers helps other crew members to keep their position. When one or more spotters stop to examine or mark trees, the others must wait. If there are more than a few trees to mark, the chief spotter will direct the other members of the crew to assist.

Trees are often missed: first, when the crew formation is temporarily lost at the end of a strip while the spotting crew is turning around, and second, when working in large groups of infested trees. The first cause of error can be corrected by holding a correct formation to the end of the strip, and by establishing this formation before starting back on the next strip. The second cause of missed trees can be corrected by respotting areas where large groups of infested trees have been marked.

Spotters' maps showing the location of the marked trees are passed to the camp manager for use of the treating crews. As treating usually follows spotting closely, treating foremen may require additional maps each night. This means that adequate copies of spotters' maps must be kept up to date at all times. Extra copies are made in the field by inserting carbons and thin white paper. This makes a nice map and the dots on the original are eliminated. A large scale progress map and a progress record are maintained in each camp office, making it necessary for chief spotters to make daily reports of the area covered and number of trees marked.

Treating Crew, Spraying Instructions

The objective of the nozzleman is to obtain a good, saturated coverage of the tree from the top of the infested part of the tree to the ground line. There is only one right way to do this because the height of the infested portion of the tree cannot be determined from the ground. Spray all trees to a 4-inch top diameter. When this 4-inch top diameter cannot be reached, oil each tree as

high as possible. With the hand and power pumps on the job the ortho-oil mix can be applied to a height of 35 feet.

To get the right coverage, the mixture must run. That is, the stream must be held until the oil flows down the tree. To just wet the tree until it is dark colored is not enough - make the spray flow.

Trees are sprayed from at least four sides. Pick the 4-inch top diameter or the highest point you can reach and direct the stream to it. Stretch your arms up - it helps a lot! If the wind bothers, wait a bit for a quiet spell. Nearly full force gets the best results for height. Remember, breeze and branches knock off a lot of footage.

Stand close to the tree. Hold the stream at the highest point for a moment until the spray starts to run down the tree. Always spray from the top down.

Back slowly away from the tree as you work the stream down and reduce the pressure. Pressure is reduced with the power pump by closing the shut-off valve - with the stirrup pump by slowing down the pumping. Hold the nozzle steady, aim for the center of the tree. Avoid any drastic or sweeping up and down movement of the nozzle, but get a good coverage. You should be able to see the oil running down the bark.

When you are spraying the lower part of the tree you should be 18 feet away from it if you have space. The farther away the more force can be used without having the spray splash off. Give the thick bark at the base a good soaking. Be careful to avoid falling in backing away from the tree.

Always spray the tree from at least four sides - larger trees need more. Spray the side toward you. Don't try to spray along the edge of the tree - too much bounces off.

Don't spray directly into the wind. A treater can stand a little to one side of the wind just as well.

Watch the drift of the spray and keep the other men in the crew out of it. Give them a "break" if they have to cross around the downwind side. Watch the pack stock, don't let drift blow on them.

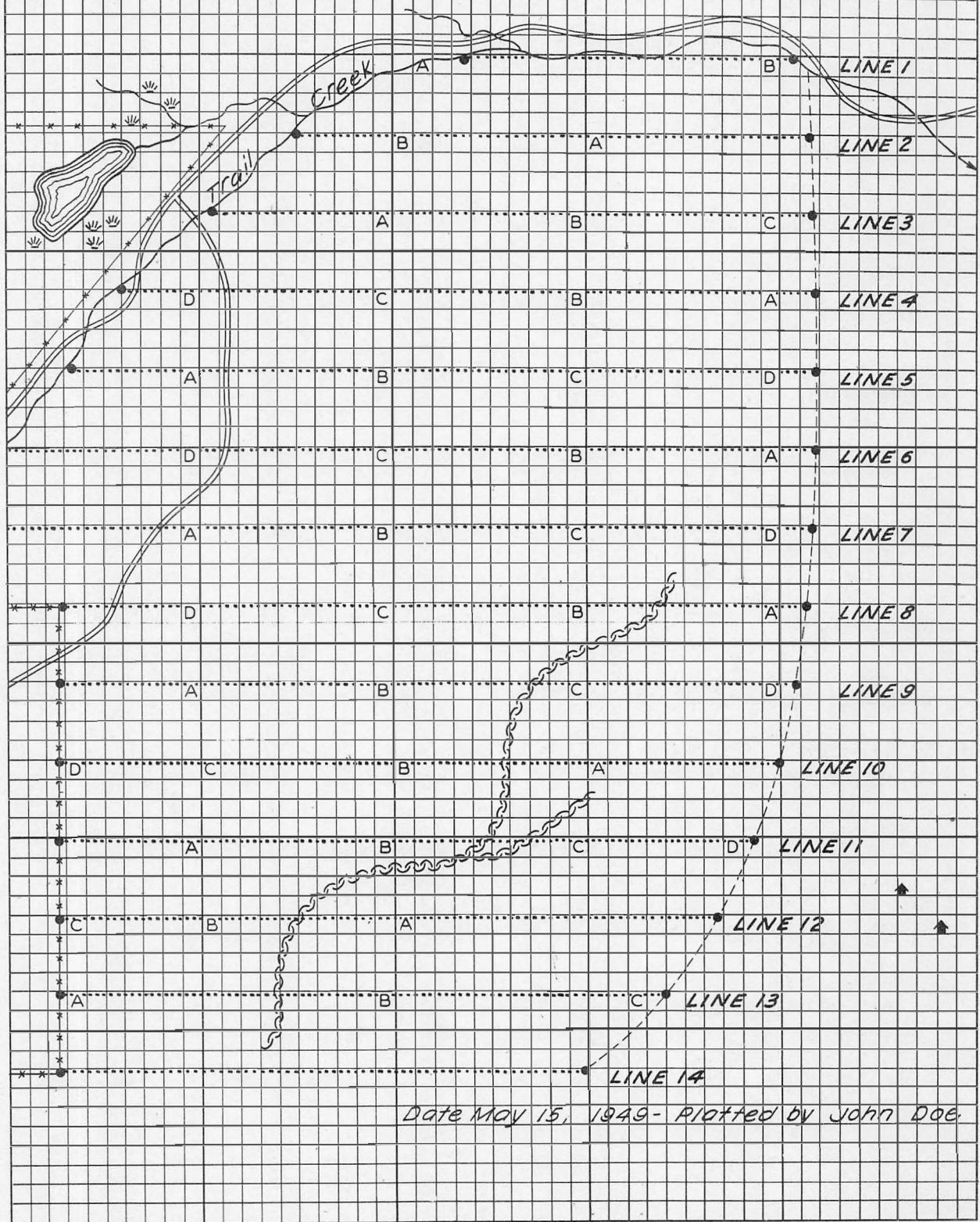
In using the stirrup pump or other hand pump, teamwork between the treater and the operator is essential. Such teamwork will permit the treater to move around the tree with a minimum of effort, and will produce an efficient working pressure for the treatment of the different portions of the tree.

Wet Trees. When necessary to treat trees with bark which has been saturated from rain or snow, the spray must be applied slowly and methodically. When the first coverage has penetrated the bark, apply a second. Missed spots on dry trees are easy to see. Extra care must be taken on wet trees to be sure that all the bark is covered thoroughly. Oil all wet trees twice, if they are saturated with water.

M-1026-R-1

COMPASS MAN'S MAP

Sec. 14 - T. 25N. R. 26W.



Date May 15, 1949 - Plotted by John Doe

• String line ends
 String line
 ----- Type line
 A Station marks



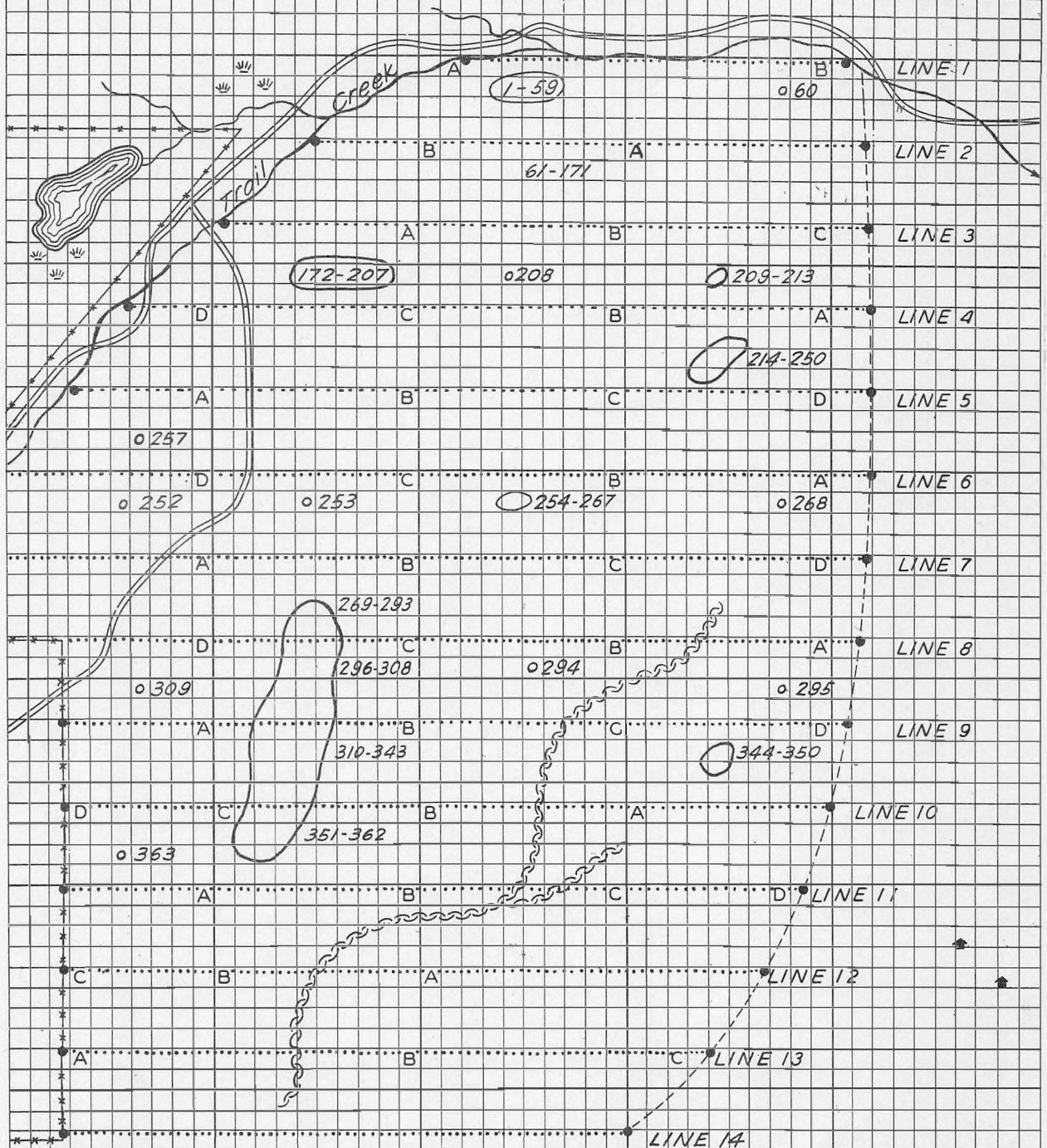
Road
 Stream
 Swamp
 Lake

Ridge
 Fence
 Buildings

M-1026-R-1

CHIEF SPOTTER'S MAP

Sec 14 - T. 25N. R. 26W.



Date May 15, 1949 Plotted by John Doe

363 Bug Trees Marked by tags on alternate string lines

1-59 Number of infested trees in strip
 (172 207) Number of infested trees in group
 0208 Single infested tree showing number

MASTER GUIDE OF MAJOR TRAINING JOBS TO BE DONE
THOMPSON RIVER INSECT CONTROL PROJECT - CABINET NATIONAL FOREST - 1949

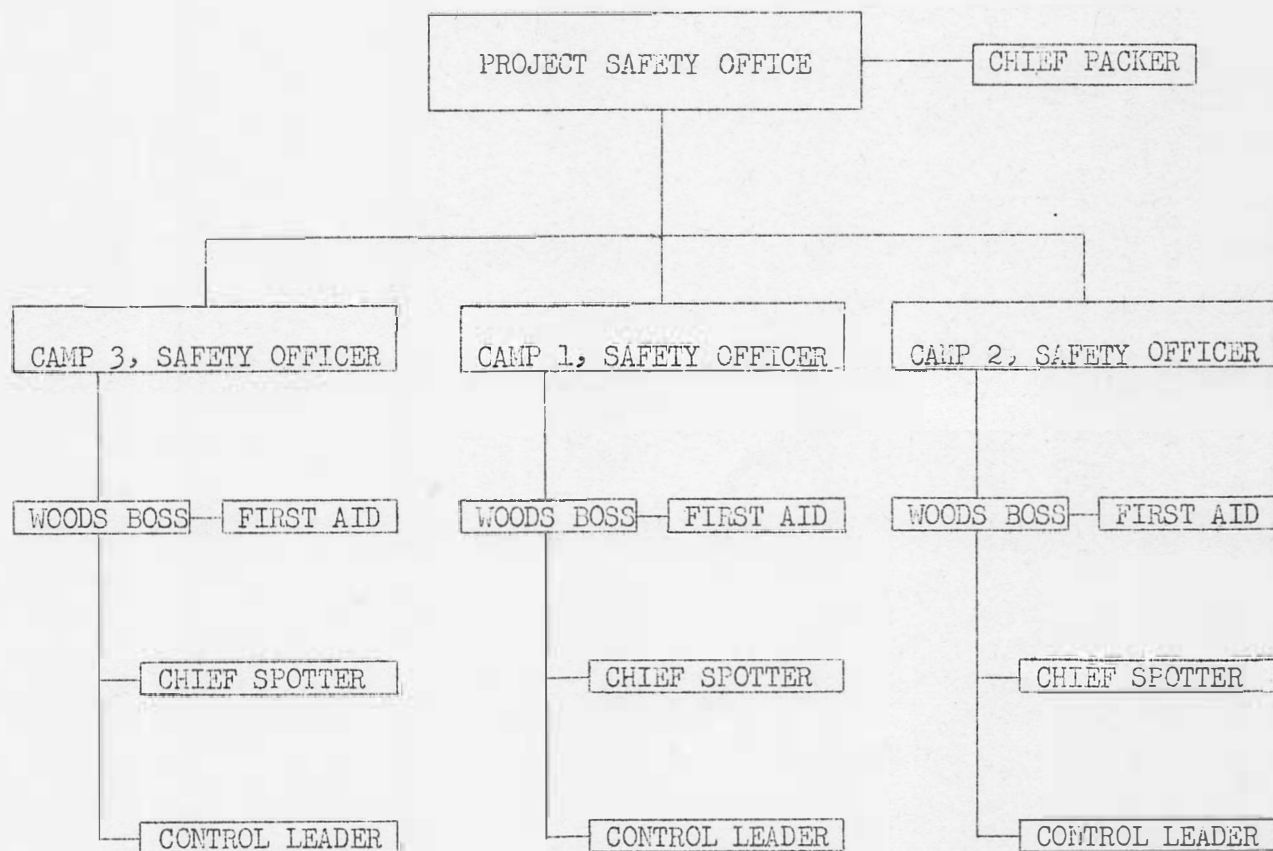
JOB OR ACTIVITY (1)	OBJECTIVE (2)	MAJOR INSTRUCTIONAL UNITS (3)	FOR WHOM (4)	HOW (5)	WHERE (6)	INSTRUCTORS (7)
ORIENTATION	TO CREATE A PRACTICAL UNDERSTANDING WHY CONTROL WORK IS NECESSARY, WHY WORK MUST BE DONE THOROUGHLY	HISTORY OF BEETLE AND ITS CONTROL EPIDEMICS OF PAST AND PRESENT CONTROL PROJECTS OF PAST AND PRESENT LIFE HISTORY OF BEETLE AND ITS EFFECT ON TREE	ALL PROJECT PERSONNEL	LECTURE, LANTERN SLIDES, AND FILM, "FIGHTING THE TREE KILLER" DISCUSSION AND DAY-TO-DAY CONTACTS	IN CAMP IN CAMP, ON JOB	GIBSON, TERRELL
	TO PROMOTE BEST COORDINATION POSSIBLE BETWEEN ALL EMPLOYEES	ORGANIZATION OF PROJECT STRUCTURAL ORGANIZATION BEPQ-FS RELATIONSHIPS PROJECT ORGANIZATION FINANCIAL COOPERATION WITH ACM AND NP CREW ORGANIZATION	SUPERVISORY PERSONNEL	ORGANIZATION CHART LECTURE INDIVIDUAL LETTERS OF INSTRUCTION DISCUSSION	IN CAMP ON JOB	FOR. SUPERVISOR, PROJECT BOSS WOODS BOSS
		CAMP RULES	SUPERVISORY PERSONNEL NONSUPERVISORY	DISCUSSION AND STAFF MEETINGS GENERAL MEETINGS, DAY-TO-DAY CONTACTS WRITE UP ON BULLETIN BOARD	IN CAMP, ON JOB	CAMP BOSS CAMP BOSS, WOODS BOSS CAMP BOSS
			ALL PROJECT PERSONNEL			
SUPERVISION	TO ASSURE SAFE, EFFECTIVE SUPERVISION	FOREMANSHIP JOB INSTRUCTION TRAINING	FOREMEN WHO NEED IT	DISCUSSIONS	IN CAMP, ON JOB	CAMP BOSS
SAFETY	TO ASSURE SAFETY CONSCIOUSNESS AND PRACTICE ON JOB	THE CAMP SAFETY PLAN	SUPERVISORY PERSONNEL NONSUPERVISORY ALL PROJECT PERSONNEL	DISCUSSION MEETINGS DAY-TO-DAY CONTACTS MEETINGS AND FILMS	IN CAMP ON JOB IN CAMP	CAMP BOSS WOODS BOSS CAMP BOSS, S.O. AND R.O.
SPOTTING	TO MAKE SURE NO INFESTED TREES ARE MISSED	IDENTIFYING INFESTED TREES TAGGING INFESTED TREES	ENTIRE SPOTTING CREW	DEMONSTRATION AND DOING AND THROUGH WRITTEN INSTRUCTIONS VERBAL AND WRITTEN INSTRUCTIONS	IN INFESTED AREAS IN CAMP, ON JOB	GIBSON, TERRELL CHECKER, TRAINER, CHIEF SPOTTER CAMP BOSS GIBSON, TERRELL
		SUPERVISORY RESPONSIBILITIES REPORTING	CHIEF SPOTTER			
	TO MAKE SURE NO AREA IS MISSED	COMPASS WORK LAYING STRING TAGGING LINES FOR DISTANCE AND INFESTED TREES REPORTING ON STRING LAYING MAPPING	STRING LAYER STRING LAYER AND CHIEF SPOTTER STRING LAYER	DEMONSTRATION AND DOING	ON JOB	GIBSON, TERRELL CHECKER, TRAINER
TREATING	TO MAKE SURE ALL INFESTED TREES ARE EFFECTIVELY TREATED	SPRAYING - USE OF EQUIPMENT COVERAGE ON TREE PUMP OPERATION	CONTROL LEADER (NOZZLEMAN) PUMP MAN AND CONTROL LEADER PACKERS	DEMONSTRATION AND WRITTEN INSTRUCTIONS DEMONSTRATION AND DOING	ON JOB	GIBSON, TERRELL, CHECKER, TRAINER AND CHIEF PACKER CHIEF PACKER
		PACKING OF SPRAY HANDLING OF STOCK				

JOB OR ACTIVITY (1)	OBJECTIVE (2)	MAJOR INSTRUCTIONAL UNITS (3)	FOR WHOM (4)	HOW (5)	WHERE (6)	INSTRUCTORS (7)
TREATING (CONT.)		TAGGING SYSTEM REPORTING	ENTIRE TREATING CREW CONTROL LEADER	EXPLANATION VERBAL AND WRITTEN INSTRUCTIONS	ON JOB IN CAMP, ON JOB	GIBSON, TERRELL, CHECKER, TRAINER GIBSON, TERRELL
CHECKING	TO ASSURE EFFECTIVE SPOTTING, CONTROL AND REPORTING	ALL POINTS ABOVE UNDER SPOTTING ALL POINTS ABOVE UNDER TREATING	CHECKER, TRAINER	INTENSIVE TRAINING LETTERS OF INSTRUCTION	ON JOB, IN CAMP	GIBSON, TERRELL CAMP BOSS
SPRAY MIX- ING AND HANDLING	TO ASSURE SAFE, EFFECTIVE USE OF INSECTICIDE	SAFETY PRECAUTIONS - ORTHO AND OIL MIXING ORTHO AND OIL	ALL PROJECT PERSONNEL MIXER	POST PRECAUTIONS ON BULLETIN BOARD DISCUSS AT GENERAL SAFETY MEETING DEMONSTRATION	IN CAMP BEND R. S.	CHECKER, TRAINER, GIBSON, TERRELL GIBSON, TERRELL, WEST
TIMEKEEPING AND REPORT- ING	TO ASSURE EFFICIENT AND PROMPT DISBURSEMENT AND ACCOUNTABILITY	TIMEKEEPING SERVICE OF SUPPLY	ASSISTANT CAMP BOSS	DEMONSTRATION AND DISCUSSIONS	IN CAMP	MCCLURE WEST
	TO ASSURE PROMPT AND PRECISE REPORTING ON PROGRESS OF SPOTTING AND CONTROL	COMPILATION OF SPOTTING AND TREATING REPORTS	ASSISTANT CAMP BOSS	DEMONSTRATION AND DISCUSSIONS	IN CAMP	MCCLURE

FOOTNOTE - SEE SPECIFIC INSTRUCTIONS FOR FURTHER REFERENCE: "GENERAL INSTRUCTIONS," "SPRAYING INSTRUCTIONS," "SAFETY CODE," "THOMPSON RIVER INSECT CONTROL PROJECT ORGANIZATION CHART." OTHER AIDS ON REQUEST.

K
SAFETY - Cabinet
Thompson River Bug Control Job, 1949

SAFETY PLAN OBJECTIVE:
Keep employee's injuries and property losses to a minimum



SAFETY PLAN FOR THOMPSON RIVER INSECT CONTROL PROJECT - 1949
MAJOR OBJECTIVE: COMPLETE THE PROJECT WITH A MINIMUM OF ACCIDENTAL INJURIES AND PROPERTY DAMAGE

ADMINISTRATIVE RESPONSIBILITY	JOB OR ACTIVITY	WHERE	HOW	SPECIAL ATTENTION ITEMS
PROJECT SUPERINTENDENT	<ol style="list-style-type: none"> 1. PROVIDE FOR INCORPORATION OF SAFETY INTO PLANNING, SUPERVISION, TRAINING, INSPECTION AND CORRECTION FOLLOW-UP BY CAMP BOSSES AND THEIR SUBORDINATES. 2. SEE THAT QUALIFIED FIRST AID MEN ARE SELECTED EACH CAMP, ARE INSTRUCTED, AND THAT FOLLOW-UP CARE, TRANSPORTATION AND MEDICAL ATTENTION ARE PLANNED FOR AND PROVIDED WHEN NEEDED. DESIGNATE WOODS BOSSES IF QUALIFIED. 3. SEE THAT FOOD HANDLERS HAVE HEALTH CERTIFICATES, ARE NEAT, CLEAN, AND EMPLOY SANITARY METHODS. 4. VEHICLE DRIVERS ARE QUALIFIED TO TRANSPORT LOADS OF MEN, BY TESTS, CHECKS, AND USDA DRIVER'S PERMITS. 5. DESIGNATE, INSTRUCT CAMP BOSSES AS SAFETY OFFICERS. 	<p>EACH PROJECT JOB AND ACTIVITY</p> <p>DO</p> <p>DO</p> <p>DO</p> <p>DO</p>	<p>DISCUSSIONS, WRITTEN INSTRUCTIONS AND REFERENCE TO "SAFETY CODE"</p> <p>THROUGH CAMP BOSSES BY DISCUSSION AND INSTRUCTIONS</p> <p>BY CHECKING TO SEE THAT OUTSTANDING REQUIREMENTS ARE COMPLIED WITH</p>	(ASSISTED BY REGIONAL SAFETY OFFICER)
CAMP BOSS	<ol style="list-style-type: none"> 1. PROVIDE FOR CAMP PLANS, FACILITIES, SANITATION, FIRE PROTECTION AND EMPLOYEE'S PLANNED WELFARE-RECREATION. 2. PROVIDE SAFETY-CAMP RULES POSTER BOARD. 3. PROVIDE SAFETY TRAINING TO ALL AS NEEDED (SCHEDULE AT LEAST ONE GENERAL SAFETY MEETING). 4. CONTROL STORAGE, USE OF FIREARMS. 5. PLAN, ORGANIZE CAMP FIRE PROTECTION. 6. DIRECT, STIMULATE CONTINUOUS "HAZARD ROUND-UP." 7. PROVIDE, INSTRUCT AND EQUIP QUALIFIED FIRST AID MEN. 	<p>EACH CAMP</p> <p>STRATEGIC CAMP SPOT</p> <p>CAMP AND PROJECT</p> <p>" " "</p> <p>KITCHEN, TENTS, STORAGE</p> <p>CAMP AND PROJECT</p> <p>" " "</p>	<p>BY ADVICE, WHERE NECESSARY, AND DIRECTION TO SUBORDINATES</p> <p>MOUNTED AT EYE LEVEL</p> <p>INDIVIDUAL GROUP INSTRUCTIONS, INSPECTIONS, AND THROUGH SUPERVISING PERSONNEL ASSISTED BY CHECKER-TRAINER</p> <p>FIRE EXTINGUISHERS, PIPE OUTLETS, WATER BUCKETS, BARRELS STRATEGICALLY PLACED PERSONALLY AND THROUGH ALL PERSONNEL</p> <p>CHECK POSSIBILITIES, PREFERABLY OVERHEAD, OTHERWISE DESIGNATE OTHERS</p>	<p>SEE "SAFETY CODE" AND F.S. MANUAL GA-G3 QUARTERS STANDARDS</p> <p>"NO SMOKING" RULES, SAFETY, CONDUCT, ETC. SPECIFIC DANGERS ON EACH JOB CONCERNED</p> <p>NO SHOOTING OR LOADING GUNS IN CAMP SIGNING AND SAFEGUARDING GASOLINE AND OIL STORAGES</p> <p>SPECIFIC INJURY-CAUSING HAZARDS</p> <p>SEE THAT TRUCK AND JOB FIRST AID KITS ARE AVAILABLE AT ALL TIMES</p>
WOODS BOSS	<ol style="list-style-type: none"> 1. SEE THAT CAMP BOSS SAFETY-FIRST AID INSTRUCTIONS ARE CARRIED OUT. ACT AS FIRST AID MAN WHEN DESIGNATED. 2. ENFORCE "NO SMOKING" RULE, RESTRICT SMOKING TO PLANNED REST PERIODS. 3. SEE THAT CHIEF SPOTTERS, CONTROL LEADERS AND CHIEF PACKER REDEEM THEIR SAFETY RESPONSIBILITIES. 4. IF QUALIFIED, MAY SERVE AS FIRST AID MAN, OTHERWISE DESIGNATE AND INSTRUCT ONE. 	<p>DURING TRANSPORTATION AND ON JOB</p> <p>ON WORK JOBS AND IN OPEN TRUCKS</p> <p>EN ROUTE TO, FROM AND ON JOBS</p> <p>EACH GROUP OF JOBS</p>	<p>PERSONAL CHECK, INSTRUCTIONS, AND THROUGH SUBORDINATES</p> <p>DO</p> <p>DO</p> <p>ASSISTANCE OF CAMP BOSS, CHECKING FOR QUALIFICATIONS</p>	<p>INJURY-PREVENTING COMMON SENSE SAFE PRACTICES ALL JOBS (CARRY POCKET FIRST AID KIT ON JOB.) BE SURE MATCHES AND TOBACCO ARE "DEAD OUT"</p> <p>SETTING PROPER EXAMPLES AND FIRM REQUIREMENTS</p> <p>PROVIDE ESSENTIAL FIRST AID MATERIALS AND PROMPT TREATMENT OF INJURIES</p>

ADMINISTRATIVE RESPONSIBILITY	JOB OR ACTIVITY	WHERE	HOW	SPECIAL ATTENTION ITEMS
CHIEF SPOTTER	1. CARRY OUT SAFETY-FIRST AID INSTRUCTIONS, SEE THAT SUBORDINATES DO SO. 2. EFFECTIVE JOB INSTRUCTION AND WORK CONTROL. 3. CARRY POCKET FIRST AID KIT.	ON JOB " " " "	CHECKING EFFECTIVE TRAINING " " " " " "	SAFE WORK PRACTICES AND IMMEDIATE CARE OF INJURED PRIOR PLANNING, CORRECTIVE MEASURES, COMMON SENSE WOODSMANSHIP
CONTROL LEADER	1. CARRY OUT SAFETY-FIRST AID INSTRUCTIONS, SEE THAT SUBORDINATES DO SO. 2. SPRAY HANDLERS GUARD AGAINST SPRAY. 3. PROVIDE NEEDED COTTON RAGS. 4. CARRY POCKET FIRST AID KIT.	ON JOB " " " " " "	CHECKING EFFECTIVE TRAINING WEAR FACE SHIELD, PROPER CLOTHES, EMPLOY SAFE PRACTICES WIPE OFF SPRAY FROM SKIN	PROPER HANDLING OF SPRAY TO PREVENT INJURY TO EMPLOYEES TREAT EXPOSED SKIN WITH "VASELINE" OR "FENDO" BEFORE HANDLING SPRAY BATHE EACH NIGHT COMMON SENSE WOODSMANSHIP
CHIEF PACKER	1. PROVIDE EFFECTIVE JOB TRAINING FOR EACH PACKER. 2. CARE, TREATMENT, FIRST AID TO PERSON OR ANIMAL.	ON JOB " "	BEFORE AND DURING JOB " " " "	COMMON SENSE HORSEMANSHIP SAFE PRACTICES PREVENTION OR TREATMENT SORE BACKS, SNAGGED LEGS, SPILLED SPRAY ON PERSON OR ANIMAL COMMON SENSE WOODSMANSHIP

S
COOPERATION
Insect Control
Thompson River Unit

COOPERATIVE AGREEMENT

This agreement, made and entered into this 5th day of May, 1949, between the Anaconda Copper Mining Company, Lumber Department, Bonner, Montana, hereinafter called the Anaconda Company, the Northern Pacific Railway Company, Land Department, St. Paul 1, Minnesota, hereinafter called the Northern Pacific, the State Forester, State of Montana, Missoula, Montana, hereinafter called the State Forester, the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Coeur d'Alene, Idaho, hereinafter called the Bureau, and the Regional Forester, Forest Service, U. S. Department of Agriculture, Missoula, Montana, hereinafter called the Forest Service, under authority of the Act of March 3, 1925 (43 Stat. 1132), June 30, 1914 (38 Stat. 430) and the Forest Pest Control Act (Public Law 110, approved June 25, 1947; 16 USCA 594-1 to 5),

W I T N E S S E T H:

WHEREAS, in the protection and administration of certain lands principally located in Townships 22, 23, 24, 25 and 26 North, Ranges 25, 26, 27 and 28 West, Montana Meridian, in and contiguous to the Thompson River drainage, the ownership of which is vested in large part in the Anaconda Company, Northern Pacific, the State of Montana, and the Forest Service, being part of or near the Cabinet National Forest,

WHEREAS, the lodgepole pine and ponderosa pine timber on the lands of all parties is seriously threatened by an infestation of injurious insects,

WHEREAS, the extent and severity of the infestation must be determined and the infestation must be controlled for the protection of the threatened timber,

WHEREAS, the parties hereto desire that the survey and control work on their lands and all of the intermingled lands, where infested trees are a threat to the lands of any party, be undertaken by the Forest Service, which shall be designated as the operating agency and the technical direction as to survey and control measures by the Bureau,

WHEREAS, the completion of the survey and control of the infestation on the intermingled ownerships, including the lands of the United States, is vital for the protection of the timber on lands of all parties, the Forest Service is willing to carry out such surveys and to perform such control work as may be needed to complete the control of the infestation;

NOW, THEREFORE, the parties hereto, recognizing that speed of control is vital and in order to quickly arrive at an equitable formula for financial participation by each of the parties, do agree that each party should contribute finances in accordance with the following formula number one:

Formula
Number One

<u>Ownership</u>	<u>Acres</u>	<u>Percent</u>
Forest Service	189,880)	
Public Domain	4,080)	54.5
Anaconda Company	83,320	23.4
Northern Pacific	56,260	15.8
State of Montana	22,400	6.3
	<u>355,940</u>	<u>100.0</u>

Inasmuch as the State Legislature will not be in session in time to appropriate the share that the State should contribute in advance, the immediate financing is shown in the following formula number two, which will require each of the participating parties to increase their share through advancing their pro rate of the State's share. In the event that contributions are obtained from the State of Montana under formula number one, all parties named in formula number two will share therein in proportion to their respective contributions actually made under formula number two. Collections from the State of Montana will be made by the Forest Service and deposited into the Cooperative Work Fund set up for the undertaking provided for in this agreement.

Formula
Number Two

<u>Ownership</u>	<u>Acres</u>	<u>Percent</u>
Forest Service	189,880)	
Public Domain	4,080)	58.2
Anaconda Company	83,320	24.9
Northern Pacific	56,260	16.9
	<u>333,540</u>	<u>100.0</u>

Inasmuch as the government of the United States has not appropriated the share recognized by the Forest Service as the equitable portion that should be paid by the United States, and inasmuch as the government of the United States may not appropriate any or the full share of its portion, the remaining two owners, recognizing the need for immediate starting of the operation through installation of camps, arrangement for equipment and supplies, and the employment of such personnel as are essential to the orderly accomplishment of the successive steps of the needed control project, do agree to finance the project initially with full recognition that the entire project may have to be stopped if the United States does not substantially provide the funds required for its share; PROVIDED, that the Anaconda Company and the Northern Pacific may mutually agree that the operation must be stopped at any time prior to the completion of the project in the event that the United States does not finance its share of the project: FURTHER PROVIDED, that upon the appropriation of the funds required to finance the equitable share of the project for the United States, then and thereafter the parties are obligated to complete the project as indicated in formula number two as indicated above; PROVIDED, HOWEVER, that the total obligation of all parties under this agreement shall not exceed \$100,000 unless otherwise agreed to by all parties by amendment supplementary hereto.

In the event that the Anaconda Company and the Northern Pacific, when faced with the knowledge that the United States has failed to finance its share, may elect to stop the project, they will notify the Forest Service at Missoula,

Montana, in writing of such decision. The Forest Service will then stop the project and close the operation at the least practicable expense, but it is understood that the Anaconda Company and the Northern Pacific will pay all obligations necessarily incurred through the operation, including the cost of closing down.

The Anaconda Company and the Northern Pacific will each deposit into the Cooperative Work Fund (under the Acts of March 3, 1925 (43 Stat. 1132) and June 30, 1914 (38 Stat. 430), and the Forest Pest Control Act (Public Law 110, approved June 25, 1947; 16 USCA 594-1 to 5)), in advance of work performed by the Forest Service and the Bureau, a payment of \$2,500.00 and will thereafter make payments as requested by the Forest Service in accordance with financial formula number two, which funds will be needed and used to pay operating costs of the Forest Service and the Bureau to accomplish the control of the infestation, and will deposit into the said Cooperative Work Fund, upon execution hereof, the initial payment above stated. Remittance to be made in favor of the Treasurer of the United States and deposited with the Regional Fiscal Agent, Missoula, Montana. Any part of the deposits of the parties hereto not expended by the Forest Service for the purposes above stated shall be refunded to the depositors in accordance with the financial formula number two hereinabove stated.

It is agreed between the Anaconda Company and the Forest Service that a certain agreement, No. Alfs-14178, made and entered into the 12th day of April, 1949, is canceled effective upon execution of this agreement by the parties hereto; PROVIDED, the obligations and balances from that agreement shall be transferred to and become a part of the obligations and funds of this agreement; and FURTHER PROVIDED, each of the parties hereto agree to acceptance of the obligations and balances credited to the Anaconda Company as a part of this agreement and the same shall be charged and credited to the operation of this agreement in accordance with the financial formula number two hereinabove stated.

Nothing herein contained shall be construed as obligating the government except upon passage of an appropriation by Congress from which expenditures thereunder may be made for the conduct of this agreement and shall not obligate the United States upon failure of Congress to so appropriate.

Nothing herein contained shall be construed as obligating the State Forester except upon passage of an appropriation by the Legislature of the State of Montana from which expenditures thereunder may be made for the conduct of this agreement and shall not obligate the State Forester upon failure of the Legislature to so appropriate.

The United States will not be liable for any damages arising from services furnished under this agreement.

No party to this agreement nor any contractor, subcontractor, agent, or employee of any party shall discriminate in the performance of this agreement, against any employee or applicant for employment because of race, creed, color, or national origin.

No member of or delegate to Congress or resident commissioner, after his election or appointment, and either before or after he has qualified or during his continuance in office, shall be admitted to any share or part of this contract or agreement, or to any benefit arising therefrom. Nothing, however, herein contained shall be construed to extend to any incorporated company where such contract or agreement is made for the general benefit of such incorporation or company. (Section 3741 R. S. and Sections 114-116 of the Act of March 4, 1909.)

IN WITNESS WHEREOF, the parties hereto have affixed their signatures on the day and year first hereinbefore written, and the Regional Forester, Forest Service, U. S. Department of Agriculture, of Missoula, Montana, on the 13th day of May, 1949.

WITNESSES:

/s/ Rolland Huff
/s/ George Neff

WITNESSES:

/s/ T. W. Anderson
/s/ Alice E. Crean

WITNESSES:

/s/ Nita C. Beckwith
/s/ Rolland Huff

WITNESSES:

/s/ Violet L. Barber
/s/ Philip C. Johnson

ANACONDA COPPER MINING COMPANY

By /s/ H. F. Root

Manager

Official Title

NORTHERN PACIFIC RAILWAY COMPANY

By /s/ L. L. Schwarm

Land Commissioner

Official Title

/s/ Rutledge Parker

State Forester, State of Montana

BUREAU OF ENTOMOLOGY & PLANT QUARANTINE,

U. S. DEPARTMENT OF AGRICULTURE

By /s/ James C. Evenden

Senior Entomologist

Official Title

/s/ James C. Iler

ACTING REGIONAL FORESTER, Forest
Service, U. S. Department of
Agriculture, Missoula, Montana

S

Alfs-14178

COOPERATION - Cabinet
Anaconda Copper Mining Company

COOPERATIVE AGREEMENT

This agreement, made and entered into this 12th day of April, 1949, between the ANACONDA COPPER MINING COMPANY, Lumber Department, Bonner, Montana, and the REGIONAL FORESTER, Forest Service, U. S. Department of Agriculture of Missoula, Montana, under authority of the Acts of March 3, 1925 (43 Stat. 1132), and June 30, 1914 (38 Stat. 430),

W I T N E S S E T H:

WHEREAS, in the protection, investigation and administration of certain lands in Townships 22, 23, 24, 25 and 26 north, Ranges 25, 26, 27, and 28 west, Montana Meridian, in the Thompson River drainage, the ownership of which is vested in large part in the Anaconda Copper Mining and in the United States, being part of or adjacent to the Cabinet National Forest,

WHEREAS, the lodgepole pine and ponderosa pine timber on the lands of both parties is seriously threatened by an infestation of injurious insects,

WHEREAS, the extent and severity of the infestation must be determined through an adequate survey in order that control measures may be soundly designed,

WHEREAS, the Anaconda Copper Mining Company desires that the survey on their lands and intermingled lands including these of the United States be undertaken by the trained forest insect survey men of the Forest Service under the direction of competent insect survey officers of the Forest Insect Division of the Bureau of Entomology and Plant Quarantine,

WHEREAS, the completion of the survey of the infestation on the intermingled ownerships including the National Forest is vital to the proper planning of control measures by the Company and the Forest Service, the Regional Forester is willing to carry out such surveys as are needed to complete the determination of control measures;

NOW THEREFORE, the Anaconda Copper Mining Company will deposit into the cooperative work fund (under the Acts of March 3, 1925, 43 Stat. 1132, and June 30, 1914, 38 Stat. 430) in advance of work performed by the U. S. Forest Service, the sum of Two Thousand Five Hundred Dollars (\$2,500.00), which will be needed to pay wages, auto mileage, per diem, and other travel expenses of the employees of the United States in performing such work, and will deposit into this said cooperative fund upon execution hereof, the amount above stated. Remittance to be made in favor of the Treasurer of the United States and deposited with Regional Fiscal Agent, Missoula, Montana. Any part of the said deposit not expended by the Regional Forester for the purposes above stated shall be refunded to the Anaconda Copper Mining Company.

The United States will not be liable for any damages arising from services furnished under this agreement.

Neither the Anaconda Copper Mining Company nor any contractor, subcontractor, agent or employee of the Anaconda Copper Mining Company shall discriminate, in

the performance of this agreement, against any employee or applicant for employment because of race, creed, color, or national origin.

No member of or delegate to Congress or resident commissioner, after his election or appointment, and either before or after he has qualified or during his continuance in office, shall be admitted to any share or part of this contract or agreement, or to any benefit arising therefrom. Nothing, however, herein contained shall be construed to extend to any incorporated company where such contract or agreement is made for the general benefit of such incorporation or company. (Section 3741 R. S. and Sections 114-116 of the Act of March 4, 1909.)

IN WITNESS WHEREOF, the parties hereto have affixed their signatures, the Anaconda Copper Mining Company on the day and year first hereinbefore written, and the Regional Forester, Forest Service, U. S. Department of Agriculture of Missoula, Montana, on the 12th day of April, 1949.

ANACONDA COPPER MINING COMPANY

By /s/ H. F. Root

Manager

Official Title

WITNESSES:

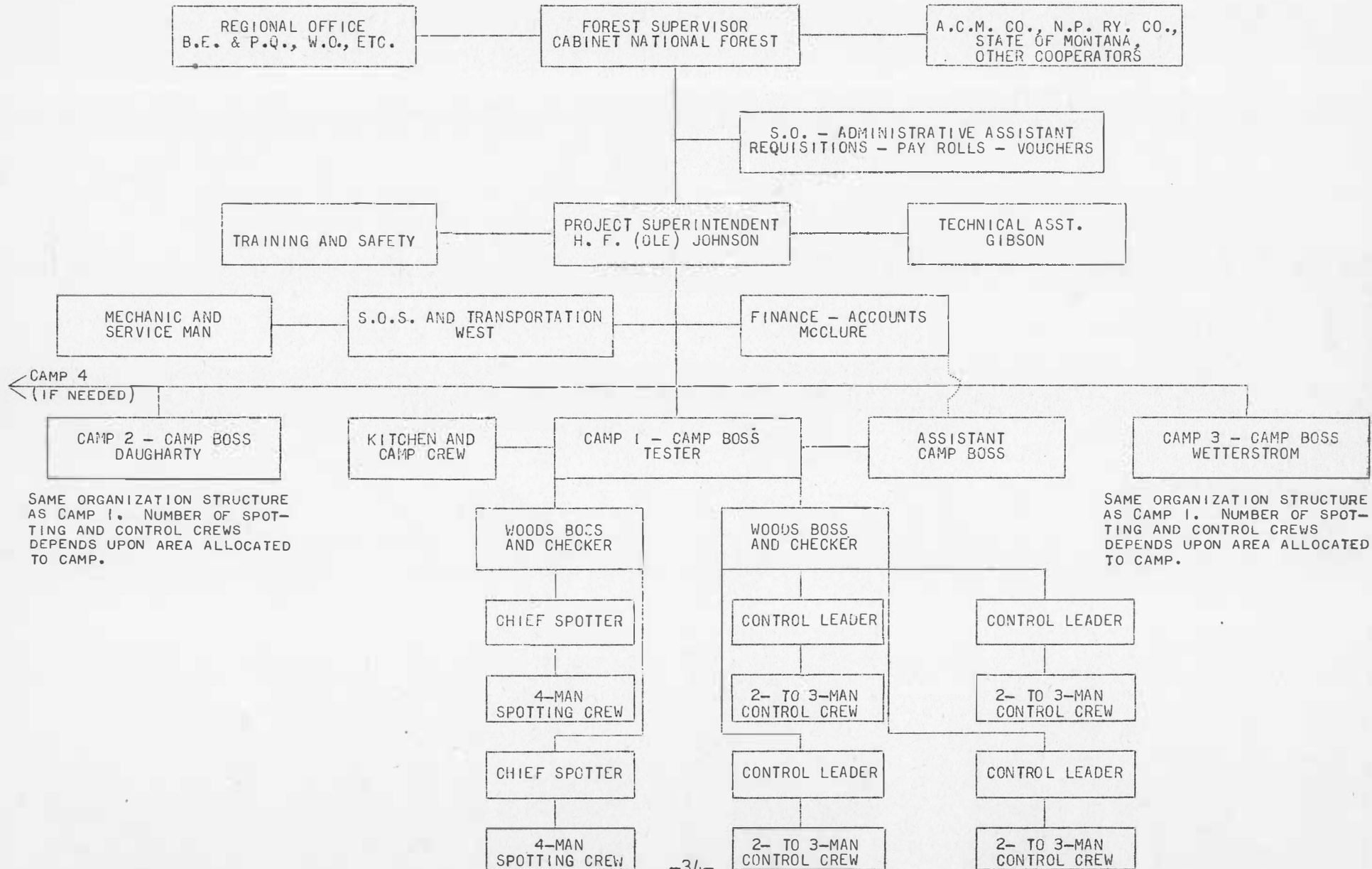
/s/ George Neff

/s/ G. M. DeJarnette

ACTING REGIONAL FORESTER, Forest Service
U. S. Department of Agriculture,
Missoula, Montana

Certified true copy.

THOMPSON RIVER INSECT CONTROL PROJECT - ORGANIZATION CHART - 1949



THOMPSON RIVER INSECT CONTROL JOB 1949

CABINET NATIONAL FOREST, MONTANA

0 1 2 3 4 5 6 MILES

- Area of intensive survey
April and May 1949
- Area treated June and
July 1949
- Boundary of infested area

NO.	UNIT NAME	NUMBER TREES TREATED
1	Lambert Creek	1029
2	Fishtrap	1562
3	Big Thompson	1788
4	Meadow Creek	12378
5	Rock Creek	55
6	Little Thompson	107
7	Deerhorn	8
8	Big Hole	87
9	Bug Creek	321
10	Pleasant Valley	444
11	Thompson Lake	69
12	Yakt	600
13 & 14	Lost Prairie	972
15	N.W. Lost Prairie	0
TOTAL		19420

